

Name: _____
A2 Q3T3 Review

Be sure to study your notes and homework assignments!

- 1) If $f(x) = 3x - 1$ and $g(x) = 4x + 3$, what does $g(f(x))$ equal?
 A) $12x + 8$ B) $12x^2 + 5x - 3$ C) $12x - 1$ D) $12x^2 + 13x - 3$
- 2) If $g(x) = \sqrt{x}$ and $h(x) = x^3 - 1$, then $g(h(4))$ equals
 A) $\sqrt{63}$ B) 5 C) $\sqrt{11}$ D) 7
- 3) If $f(x) = \frac{2}{x+3}$ and $g(x) = \frac{1}{x}$, then $(g \circ f)(x)$ is equal to
 A) $\frac{x+3}{2x}$ B) $\frac{1+3x}{2x}$ C) $\frac{x+3}{2}$ D) $\frac{2x}{1+3x}$
- 4) If $g(x) = x + 3$ and $f(x) = x^2 - 2$, find the value of $g(f(3))$.
- 5) If $g(x) = x + 3$ and $f(x) = x^2 - 2$, find the value of $f(g(a+2))$.
- 6) If $f(x) = x - 3$ and $g(x) = x^2$, find the value of $(f \circ g)(2)$.
- 7) The function $f(x) = \frac{1}{x-3}$ is defined for all real numbers except when x equals
 A) $-\frac{1}{3}$ B) 3 C) 0 D) -3
- 8) The function $f(x) = \sqrt{x-4}$ is real for what values of x ?
 A) $\{x | x < 0\}$ B) $\{x | x \geq 4\}$ C) $\{x | x > 0\}$ D) $\{x | x \leq 4\}$
- 9) The domain of the real-valued function $f(x) = \frac{1}{\sqrt{x-3}}$ contains which of the following numbers?
 A) -1 B) 2 C) 3 D) 7
- 10) What is the domain of $f(x) = \frac{1}{\sqrt{4-x^2}}$?

$$g(3x-1) = 4(3x-1) + 3$$

$$= 12x - 4 + 3$$

$$= 12x - 1$$

$$2) g(h(4))$$

$$h(4) = 4^3 - 1 = 63$$

$$g(63) = \sqrt{63} \quad (A)$$

$$3) (g \circ f)(x)$$

$$f(x) = \frac{2}{x+3}$$

$$g\left(\frac{2}{x+3}\right) = \frac{1}{\frac{2}{x+3}} = 1 \cdot \frac{x+3}{2} = \frac{x+3}{2} \quad (C)$$

$$4) g(f(x))$$

$$g(f(3)) = f(3) = 3^2 - 2 = 7$$

$$g(7) = 7 + 3$$

$$= 10$$

$$5) f(g(a+2))$$

$$g(a+2) = (a+2) + 3 = a+5$$

$$f(a+5) = (a+5)^2 - 2$$

$$= (a+5)(a+5) - 2$$

$$= a^2 + 5a + 5a + 25 - 2$$

$$= a^2 + 10a + 23$$

6) $(f \circ g)(2)$

$$g(2) = 2^2 = 4$$

$$f(4) = 4 - 3 = 1$$

$$(f \circ g)(2) = 1$$

7) $f(x) = \frac{1}{x-3}$ "What x-value is not in domain?"

$$\begin{array}{r} x-3 \neq 0 \\ +3 \quad +3 \\ \hline x \neq 3 \end{array}$$

(B)

8) $f(x) = \sqrt{x-4}$ "What is the domain?"

$$\begin{array}{r} x-4 \geq 0 \\ +4 \quad +4 \\ \hline x \geq 4 \end{array}$$

(B)

9) $f(x) = \frac{1}{\sqrt{x-3}}$

$$\begin{array}{r} x-3 > 0 \\ +3 \quad +3 \\ \hline x > 3 \end{array}$$

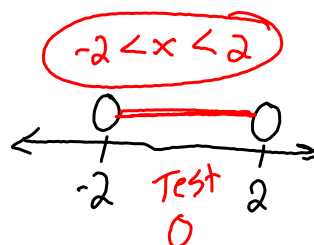
(D) 7 is the only # greater than 3.

10) $f(x) = \frac{1}{\sqrt{4-x^2}}$

$$4-x^2 > 0$$

$$(2-x)(2+x)$$

$$\begin{array}{l|l} 2-x=0 & 2+x=0 \\ 2=x & x=-2 \end{array}$$



$$4-0^2 > 0$$

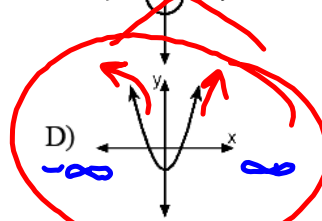
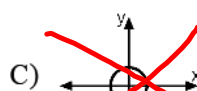
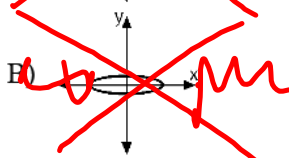
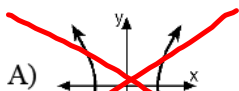
$$4-0 > 0$$

$$4 > 0$$

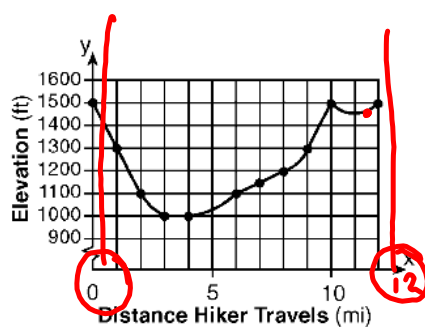
Yes

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- 11) Which graph illustrates a quadratic relation whose domain is *all* real numbers?



- 12) The accompanying graph shows the elevation of a certain region in New York State as a hiker travels along a trail.



What is the domain of this function?

A) $\{x \mid 0 \leq x \leq 12\}$

B) $\{y \mid 1,000 \leq y \leq 1,500\}$

C) $\{x \mid 1,000 \leq x \leq 1,500\}$

D) $\{y \mid 0 \leq y \leq 12\}$

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13) For the graph of the relation below:

(a) State the domain.

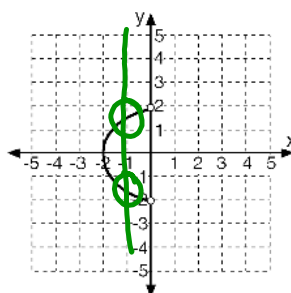
$$-2 \leq x < 0$$

(b) State the range.

$$-2 < y < 2$$

(c) State whether or not the relation is a function. [Justify your answer.]

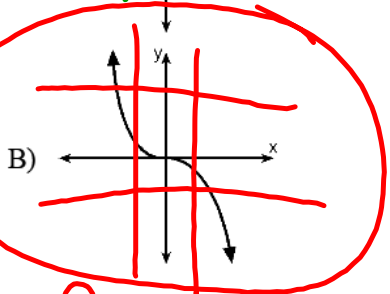
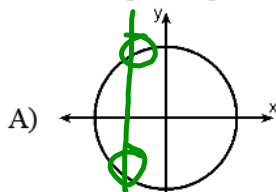
Not a function
because it fails
the Vertical Line
Test.



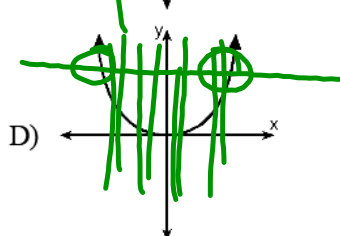
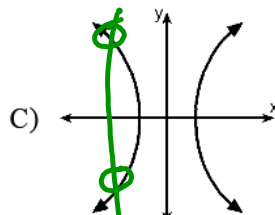
TTC-TAC-TDE

function
yes no stop
also one-to-one

14) Which diagram represents a one-to-one function?



Passes both
VLT and HLT



Function
Not 1-to-1